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EXAMINER	
STARKS, WILBERT L	

ART UNIT	PAPER NUMBER
2129	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/870,946	COOPER, DAVID L.	
	Examiner	Art Unit	
	Wilbert L. Starks, Jr.	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-90* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-90* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. §101

1. 35 U.S.C. §101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

the invention as disclosed in claims 1-90 is directed to non-statutory subject matter.

2. None of the claims is limited to practical applications. Examiner finds that *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 USC §101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Federal Circuit held that the act of:

> ...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicant's "data" references are just such abstract ideas.

3. Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by *AT&T v. Excel*. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete

agreement with those decisions. *Warmerdam* is consistent with *State Street*'s holding that:

> Today we hold that *the transformation of data, representing discrete dollar amounts; by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible result" -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.* (emphasis added) *State Street Bank* at 1601.

4. True enough, that case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but the court clearly *did not* go so far as to make business methods *per se statutory*. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application*. It would have been much easier for the court to say that "business methods were per se statutory" than it was to define the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..."

5. The court was being very specific.

6. Additionally, the court was also careful to specify that the "useful, concrete and tangible result" it found was "a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." (i.e. the trading activity is the further practical use of the real world

monetary data beyond the transformation in the computer – i.e., "post-processing activity".)

7. Applicant cites no such specific results to define a useful, concrete and tangible result. Neither does Applicant specify the associated practical application with the kind of specificity the Federal Circuit used.

8. Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

> ...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... *taking several abstract ideas and manipulating them together adds nothing to the basic equation*. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9. Since the Federal Circuit held in *Warmerdam* that this is the "dispositive issue" when it judged the usefulness, concreteness, and tangibility of the claim limitations in that case, Examiner in the present case views this holding as the dispositive issue for determining whether a claim is "useful, concrete, and tangible" in similar cases. Accordingly, the Examiner finds that Applicant manipulated a set of abstract "data" to solve purely algorithmic problems in the abstract (i.e., what *kind* of "data" are used? Generally, neural network nodes are implemented purely in software as nonlinear regression algorithms. It is possible to have hardware artificial neural nodes, but Applicant makes no such limitation in the claims) Clearly, a claim for manipulation of "data" is provably even more abstract (and thereby less limited in practical application) than pure "mathematical algorithms" (since they can be applied to solve mathematical algorithms...and more) which the Supreme Court has held are per se nonstatutory – in fact, it *includes* the expression of nonstatutory mathematical nodal and layer algorithms.

10. Since the claims are not limited to exclude such abstractions, the broadest reasonable interpretation of the claim limitations includes such abstractions. Therefore, the claims are impermissibly abstract under 35 U.S.C. §101 doctrine.

11. Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes the same view of "useful, concrete, and tangible" the Federal Circuit applied in *State Street Bank*. Therefore, under *State Street Bank*, this could not be a "useful, concrete and tangible result". There is only manipulation of abstract ideas.

12. The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v. Excel Communications, Inc.* decision. The Court reminded us that:

> Finally, **the decision in In re Warmerdam**, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) **is not to the contrary**. *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that '**taking several abstract ideas and manipulating them together adds nothing to the basic equation**'; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court's conclusion on the facts, the **holding** of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101. (emphasis added) AT&T Corp. v. Excel Communications, Inc., 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

13. Remember that in *In re Warmerdam*, the Court said that this was the dispositive issue to be considered. In the *AT&T* decision cited above, the Court reaffirms that this is the issue for assessing the "useful, concrete, and tangible" nature of a set of claims under §101 doctrine. Accordingly, Examiner views the *Warmerdam* holding as the dispositive issue in this analogous case.

14. The fact that the invention is merely the manipulation of *abstract ideas* is clear. Applicant's "data" references are simply abstract constructs that do not limit the claims

to the transformation of real world data (such as monetary data or heart rhythm data) by some disclosed process. Consequently, the necessary conclusion under *AT&T, State Street* and *Warmerdam,* is straightforward and clear. The claims take several abstract ideas (i.e., "data" in the abstract) and manipulate them together adding nothing to the basic equation. Claims 1-90 are, thereby, rejected under 35 U.S.C. §101.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. §112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-90 are rejected under 35 U.S.C. §112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the *undisclosed* practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. §101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. § 101, then the application **also fails as a matter of**

> law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112."); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention**.") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-90 are rejected on this basis.

Claim Rejections - 35 U.S.C. §102

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-5 and 27-31 are rejected under 35 U.S.C. §102(b) as being anticipated by Lo (U.S. Patent Number 5,408,424; dated 18 April 1995; class 708; subclass 303). Specifically:

Claim 1

Claim 1's "using a **plurality of layers**, each layer including a plurality of computational nodes for **implicit communication**, an input processing layer, a central processing layer, and an output processing layer;" is anticipated by Lo, Fig 6 in its entirety. Further, the "implicit communication" is anticipated by Lo, col. 5, lines. 1-17 where it recites:

> If a mathematical model of the signal and measurement processes such as (1) and (2) is available, the realizations of the signal and measurement processes are generated by computer simulation. Otherwise, these training data can be collected by conducting actual experiments with the signal and measurement processes. Since we **do not use a mathematical model to derive formulas and equations, such properties as the Markov property**, Gaussian distribution and

> additive noise are not required of the signal and measurement processes for the present invention to apply. In fact, the present invention applies to virtually **any signal process** (to be defined in the sequel) and measurement process with **only one restriction**: the values of the measurement process must lie in a compact (i.e. bounded and closed) region. This restriction is certainly not too restrictive in the real world.

In other words, the prior art can be applied to "implicit" (i.e., unsupervised) learning processes too.

Claim 1's "using at least one **feedforward** channel for inputs;" is anticipated by Lo, Fig 6 in its interlink nodes.

Claim 1's "using **full lateral and feedback** connections within the processing layers;" is anticipated by Lo, Fig 4.

Claim 1's "using an **output channel** for outputs;" is anticipated by Lo, Fig 6, element 28.

Claim 1's "using **re-entrant feedback** from the output channel to at least one of the processing layers;" is anticipated by Lo, Fig 6, element 26.

Claim 1's "using local **update** processes to update each of the plurality of computational nodes; and" is anticipated by Lo, col. 2, lines 13-18, where it recites:

> Then the EKF uses the KF equations to **update** the estimated value of x(t+1) and the predicted value of x(t+2) for the new measurement y(t+1). By iterating the linearization and estimation a certain number of times or until convergence at each time point, we have the so-called iterated EKF (IEKF).

Claim 1's "using re-entrant feedback from the output channel to perform minimalization for general computation." is anticipated by Lo, Fig 6, element 26.

Claim 1's "outputting processed data" is anticipated by Lo, Fig. 3 where there are output terminals.

Claim 2

Claim 2's "The method of claim 1, wherein the output channel uses **feedforward** connections between the output channel and at least one of the processing layers." is anticipated by Lo, Fig 6, element 28.

Claim 3

Claim 3's "The method of claim 1, wherein the output channel uses **bi-directional** connections between the output channel and at least one of the processing layers." is anticipated by Lo, col. 3, lines 31-39, where it recites:

> There is a large number of ANN paradigms such as Hopfield networks, high-order networks, counter-propagation networks, **bidirectional** associative memories, piecewise linear machines, neocognitrons, self-organizing feature maps, adaptive resonance theory networks, Boltzmann machines, multilayer perceptrons (MLPs), MLPs with various feedback structures, other recurrent neural network paradigms, etc. (Emphasis added.)

Claim 4

Claim 4's "The method of claim 1, wherein the re-entrant feedback is **uni-directional**." is anticipated by Lo, Fig. 6, element 26.

Claim 5

Claim 5's "The method of claim 1, wherein the re-entrant feedback is **bi-directional**." is anticipated by Lo, col. 3, lines 31-39, where it recites:

> There is a large number of ANN paradigms such as Hopfield networks, high-order networks, counter-propagation networks, **bidirectional** associative memories, piecewise linear machines, neocognitrons, self-organizing feature maps, adaptive resonance theory networks, Boltzmann machines, multilayer perceptrons (MLPs), MLPs with various feedback structures, other recurrent neural network paradigms, etc. (Emphasis added.)

Claim 27

Claim 27's "neural network architecture means having a **plurality of layer means**, each layer means including a plurality of adaptive computational node means, the plurality of layer means" is anticipated by Lo, Fig. 4, elements 15-19.

Claim 27's "**input** processing layer means, **central** processing layer means, and **output** processing layer means;" is anticipated by Lo, Fig. 4, elements 15-19.

Claim 27's "for implicit computation" is anticipated by Lo, Fig 6 in its entirety. Further, the "implicit communication" is anticipated by Lo, col. 5, lines. 1-17 where it recites:

> If a mathematical model of the signal and measurement processes such as (1) and (2) is available, the realizations of the signal and measurement processes are generated by computer simulation. Otherwise, these training data can be collected by conducting actual experiments with the signal and measurement processes. Since we **do not use a mathematical model to derive formulas and equations, such properties as the Markov property**, Gaussian distribution and additive noise are not required of the signal and measurement processes for the present invention to apply. In fact, the present invention applies to virtually **any signal process** (to be defined in the sequel) and measurement process with **only one restriction**: the values of the measurement process must lie in a compact (i.e. bounded and closed) region. This restriction is certainly not too restrictive in the real world.

In other words, the prior art can be applied to "implicit" (i.e., unsupervised) learning processes too.

Claim 27's "**feedforward** input channel means;" is anticipated by Lo, Fig. 4, elements 16 and 17.

Claim 27's "**full lateral and feedback** connection means within the processing layer means;" is anticipated by Lo, Fig. 4, elements 18.

Claim 27's "**output channel** means;" is anticipated by Lo, Fig. 4, elements 17.

Claim 27's "**re-entrant** feedback means from the output channel means to the processing layer means;" is anticipated by Lo, Fig. 6, element 26.

Claim 27's "means for updating each of the plurality of adaptive computational node means using local **update** processes; and" is anticipated by Lo, col. 2, lines 13-18, where it recites:

> Then the EKF uses the KF equations to **update** the estimated value of x(t+1) and the predicted value of x(t+2) for the new measurement y(t+1). By iterating the linearization and estimation a certain number of times or until convergence at each time point, we have the so-called iterated EKF (IEKF).

Claim 27's "means for using re-entrant feedback from the output channel means to perform minimalization for general computation." is anticipated by Lo, Fig 6, element 26.

Claim 28

Claim 28's "The apparatus of claim 27, wherein the output channel means uses **feedforward** connection means between the output channel means and the processing layer means." is anticipated by Lo, Fig 6, element 28.

Claim 29

Claim 29's "The apparatus of claim 27, wherein the output channel means uses **bi-directional** connection means between the output channel means and the processing layer means." is anticipated by Lo, col. 3, lines 31-39, where it recites:

> There is a large number of ANN paradigms such as Hopfield networks, high-order networks, counter-propagation networks, **bidirectional** associative memories, piecewise linear machines, neocognitrons, self-organizing feature maps, adaptive resonance theory networks, Boltzmann machines, multilayer perceptrons (MLPs), MLPs with various feedback structures, other recurrent neural network paradigms, etc. (Emphasis added.)

Claim 30

Claim 30's "The apparatus of claim 27, wherein the re-entrant feedback means is **uni-directional**." is anticipated by Lo, Fig 6, element 26.

Claim 31

Claim 31's "The apparatus of claim 27, wherein the re-entrant feedback means is **bi-directional**." is anticipated by Lo, col. 3, lines 31-39, where it recites:

> There is a large number of ANN paradigms such as Hopfield networks, high-order networks, counter-propagation networks, **bidirectional** associative memories, piecewise linear machines, neocognitrons, self-organizing feature maps, adaptive resonance theory networks, Boltzmann machines, multilayer perceptrons (MLPs), MLPs with various feedback structures, other recurrent neural network paradigms, etc. (Emphasis added.)

Response to Arguments

1. Applicant's arguments filed 09/10/2007 have been fully considered but they are not persuasive. Specifically:

Argument 1

> In rejecting Claim 1-90, on the basis of 35 U.S.C. § 101 as being directed to non-statutory subject matter the Examiner argues, inter alia, "[r]egardless of whether any of the claims are in the technological arts, none of them is limited to practical applications in the technological arts", and further argue, "[t]aking several abstract ideas and manipulating them together adds nothing to the basic equation (...). Examiner finds that Applicant's "data" references are just such abstract ideas." In response to the Applicant's previous response, the Examiner further replied "Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none."
>
> A process is patentable under Section 101 if it produces a 'useful, concrete, and tangible result'. State Street Bank & Trust Co. v. Signature

> Financial Group, Inc. 149 F. 3d 1368, 137374, 47 USPQ2d 1596, 1601-02 (Fed. Cir. 1998). The mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, does not, however, render it non-statutory subject matter, so long as it produces such a result. AT & T Corp. v. Excel Communications Inc., 172 F.3d 1352, 1359, 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).
>
> **Independent claims 1, 27, and 51 each recite a statutory process that produces a useful, concrete and tangible result; a neural network**. Independent claims 70 recites a statutory machine that implements a useful, concrete and tangible result; a **digital implementation of a neural network**. A neural network is a useful, concrete, and tangible result.

"Digital" simply means that the "neural" nonlinear regression method is performed on a digital computer.

It does not mean that Applicant has special purpose neural hardware...since neural networks are analog devices and actual special purpose neural hardware would be analog, not digital.

In the artificial intelligence arts, it is well understood that the "neural network," as generally practiced, is merely an algorithm that is a nonlinear regression algorithm. It is not statutory unless trained with real world data.

Examiner looked at the entire claimed invention to look for any statutory matter anywhere in the claims. Examiner found none and raised the rejection in order to give Applicant an opportunity to point out statutory matter on the record. Applicant merely points to the fact that it is called a neural network without actually looking at the structure to see if there was any statutory matter.

Had Applicant claimed analog hardware elements to perform algorithmic operations (such as a transconductance amplifier) or had Applicant claimed that the

algorithm was used to predict heart attacks or any other useful, concrete, and tangible result, Examiner would be much more likely to find the claims statutory. As it stands, Applicant opens the scope of the claims to capture all uses of the neural network algorithm.

§101 prohibits this. Correction is required.

Argument 2

> A neural network is a general purpose computing construct which like, for example, the Von Neumann computer architecture, has multiple implementations. Patents for general purpose computers comprise those directed to; (1) computer architecture, and (2) those directed to computer applications. There is no need to explain the applications of innovative new computer architecture to patent such an architecture; those in the field know the uses of a general purpose computer. From a patentability standpoint, a new computer architecture is, in and of itself, indisputably statutory subject matter because it is a useful, concrete, and tangible result. Such patents do not, and need not, claim any particular application, even if a specific application is separately patentable.
>
> Similarly, patents directed to neural networks comprise (1) neural network architecture, and (2) neural network applications. There is no need to explain the applications of innovative new computer architecture to patent such an architecture; those in the field know the uses of a general purpose neural network **(e.g. speech recognition, text recognition, and the like)**. From a patentability standpoint, a new neural network architecture is, in and of itself, indisputably statutory subject matter because it is a useful, concrete, and tangible result. Such patents do not, and need not, claim any particular application, even if a specific application is separately patentable.

Neural networks, as claimed by Applicant include software algorithms in their scope. Further, Applicant has not described any hardware architecture for the algorithms...only specific functions that include software representations.

Applicant further argues that his claims **can** be applied to "speech recognition, text recognition, and the like." That argument is insufficient to actually limit his claims to

such applications. Aside from not being claimed at all, those supposed "limitations" are only subsets of the actual matter limited by the claims. An argument using erroneously limiting subsets of the actual metes and bounds of the claims is not sufficient to limit the claims to statutory matter because the "claims must be given their broadest reasonable interpretation." See, MPEP 2111 (emphasis added.)

Applicant based his argument on the narrower subsets of the actually claimed matter, thereby presenting erroneously narrow claim interpretations that appear more acceptable than the ones actually drafted into the claims.

Applicant must expressly present limitations that, in their broadest reasonable interpretation, denote statutory limitations to a practical application.

Examiner cannot even rely on Festo's "prosecution history estoppel" to limit the claims to the matter in Applicant's argument, since such doctrine of equivalents issues are actually decided later in Court after an application has been allowed and later contested. Accordingly, Applicant's arguments cannot, at this early stage, be presumed by Examiner to be so limiting.

Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicant has presented no other statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, Applicant has failed to carry his burden of showing how the claims are in any way statutory. As it stands, Applicant opens the scope of the claims to capture all uses of the algorithm.

§101 prohibits this. Correction is required.

Argument 3

> Indeed, over 4,000 patents have issued on, or including components of, neural networks, lending weight to the fact neural networks are a well know computing architecture whose real world applications are extensive.

Prior patents are irrelevant. Patents have no stare decisis value.

Further, the law changes over time. It is unclear whether the cited patents were allowed under the Freeman-Walker-Abele test, and are thereby obsolete.

Further, Examiner is not permitted to comment on allowed patents. Generally speaking, however, neural networks trained with real world data are statutory. Applicant did not address this issue in his citations of prior neural network patents have been allowed. As it stands, Applicant opens the scope of the claims to capture all uses of the algorithm.

§101 prohibits this. Correction is required.

Argument 4

> Claims 1-90 also stand rejected under 35 U.S.C. § 112, first paragraph in connection with the section 101 rejection. The Examiner alleges that Applicant has not disclosed a practical application for the claimed invention. As argued above, a neural network is a practical application, much like a general purpose computer architecture, and thus the

> Applicant has disclosed a practical application. Additionally, as previously argued, Applicant notes [0057] of the present specification, discloses that the claimed invention is useful for "rapid, unsupervised processing of complex data sets, **such as** imagery, databases, textual files, or continuous human speech." Paragraph [0057] is an assertion that the claimed invention is useful for specific and substantial purposes, and this assertion would be considered credible by a person of ordinary skill in the art. Therefore, the utility requirement of section 101, and its counterpart in section 112, first paragraph, have been met and the rejection should be withdrawn for all independent claims and their corresponding dependant claims.

The argued utilities are not claimed.

Application of the algorithm to each of those argued utilities is a different invention. Applicant argues a mere subset of what was actually claimed. The claimed utilities are unspecified and undefined. Therefore Applicant has not, as a matter of fact, satisfied the utility requirement. Consequently, as a matter of law, the claims also fail §112.

Correction is required.

Argument 5

> Independent Claims 1 and 27 stand rejected under 35 U.S.C. 102(b) over Lo. The Examiner asserts that Claim 1's and Claim 27's element 'using **re-entrant feedback** from the output channel to perform minimalization for general computation.' is anticipated by Lo, Fig 6, element 26."
>
> Lo, Fig 6, element 26, is, according to the disclosure of Lo, is a "a unit time delay device" (Lo, col. 13, ln 29-30), within a multilayer perceptron with interconnected neurons (MLPWIN). The unit time delay device **merely delays the signals sent last layer nodes (i.e. the output nodes of the MLP) to its zeroth layer nodes.** There is no suggestion in the disclosure of Lo that such a unit time delay device performs the complex function of "minimalization steps on said combinations to meet specified success criteria whereby the lowest values of said combinations meeting said success criteria are retained." Thus, the minimalization step is not anticipated by Lo.

> In view of all of the above, independent claims 1 and 27, and their dependent claims 2-5 and 28-31, are not anticipated by Lo and the rejection over Lo should be withdrawn.

Actually, element 26 is **part of** a "reentrant feedback path", as **admitted** by Applicant when he argues that it shows that: " The unit time delay device merely delays the signals sent last layer nodes (i.e. the **output** nodes of the MLP) **to** its **zeroth layer nodes**. The "minimalization" step occurs when the network is trained because it minimizes errors during training (for future computation)...this is what recurrent neural networks are for. It is inherent: Specifically, this point is made clear in the abstract of the prior art where it recites:

> A method and an apparatus are disclosed for processing a measurement process to estimate a signal process. The method synthesizes realizations of a signal process and a measurement process into a primary filter for estimating the signal process and, if required, an ancillary filter for providing the primary filter's estimation error statistics. Both the primary and the ancillary filters are made out of artificial recurrent neural networks (RNNs). Their implementation results in the filtering apparatus. The synthesis is performed through training RNNs. The weights/parameters and initial dynamic state of an RNN are determined by **minimizing a training criterion** by the variation of the same. The training criterion, which is constructed on the basis of a selected estimation error criterion, incorporates the aforementioned realizations. An alternative way to determine the initial dynamic state of an RNN is to simply set it equal to a canonical initial dynamic state. After adequate training, both the primary and the ancillary filters are recursive filters optimal for the given respective RNN architectures with the lagged feedbacks carrying the optimal conditional statistics. If appropriate RNN paradigms and estimation error criteria are selected, the primary and the ancillary filters of such paradigms are proven to approximate the respective optimal filters in performance (with respect to the selected estimation error criteria) to any desired degree of accuracy, provided that the RNNs that constitute the primary and ancillary filters are of sufficient sizes.

Applicant's arguments are found by Examiner to be unpersuasive.

Examiner makes the finding of fact that Lo (U.S. Patent Number 5,408,424; dated 18 APR 1995; class 708; subclass 303) anticipates the claimed invention.

Argument 6

CONCLUSION

Having responded to all objections and rejections set forth in the outstanding Office Action, it is submitted that claims 1-90 are in condition for allowance and Notice to that effect is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is courteously requested to contact applicant's undersigned representative.

Though each rejection has contrary arguments presented by Applicant, none of Applicant's arguments is found by Examiner to be persuasive. Further, Applicant has not shifted his burden regarding the rejections. Accordingly, the rejections stand.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

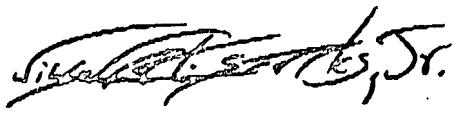
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571) 272-3691.

Alternatively, inquiries may be directed to the following:

S. P. E. David Vincent	**(571) 272-3080**
Official (FAX)	**(571) 273-8300**



Wilbert L. Starks, Jr.
Primary Examiner
Art Unit 2129

WLS

25 NOV 2007